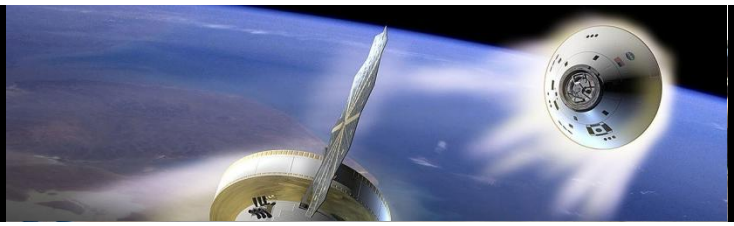
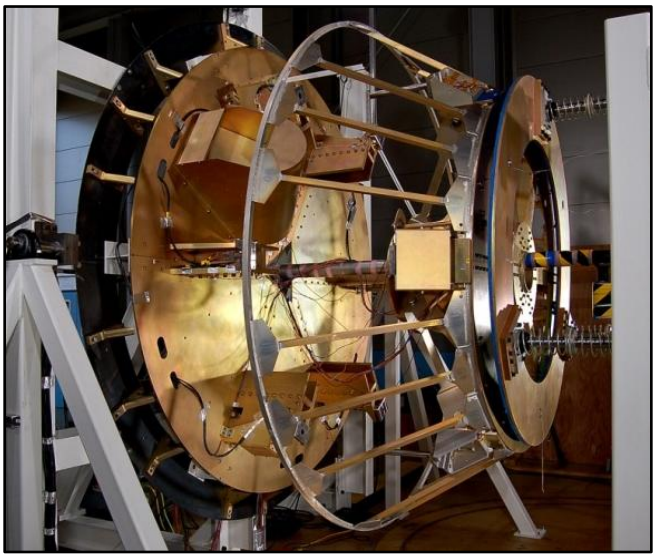
ORION
CREW EXPLORATION VEHICLE

WEEKLY ACCOMPLISHMENTS

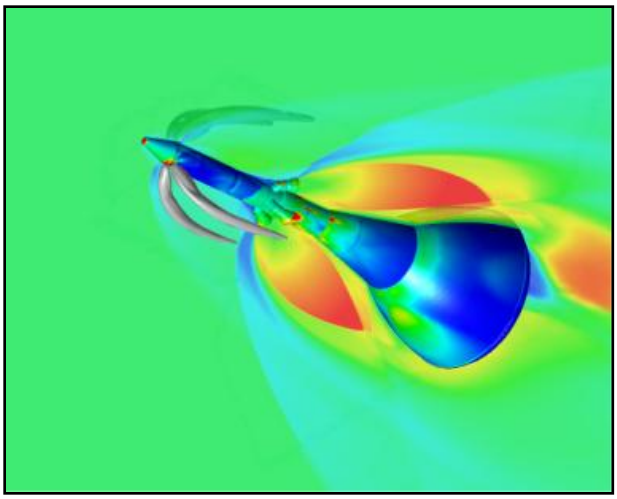


08.28.09

The Orion Ground Test Article hardware (crew cabin and backbone structures shown above) was prepared for shipment from AMRO Fabrication in El Monte, California to the Michoud Assembly Facility in New Orleans, Louisiana.



The Pad Abort 1 Forward Bay Cover (FBC) component functional and demonstration test was performed at Lockheed Martin's Quality Assurance Lab and Test Facility at the Waterton Campus in Denver, Colorado on Aug. 27. Data from the test will help determine how much tip off force and shock is created due to the FBC jettison event that would occur during a launch abort during Orion's initial ascent phase. Nearly 100 instruments recorded data during the dynamic portion of the test which took less than 0.05 second to perform.



Crew/Service Module Umbilical Proof of Concept vibration testing on the hybrid piston face seal concluded this week with the third axis being run. No leaks were detected during or after the test. The maximum g level during the random vibration was 12gs. A post sine sweep was conducted without issue. The plates were taken to Thermal Vacuum chamber for the next series of tests.

The Crew Exploration Vehicle Aero Sciences Project (CAP) Aerodynamic team completed approximately 1600 Computational Fluid Dynamics (CFD) solutions (Photo left) for the Launch Abort Vehicle abort motor jet interaction campaign. This is a significant milestone and the culmination of 18 months of effort and 3.5 million CPU-hours on the Columbia supercomputer at NASA Ames Research Center. The CFD campaign obtained data to characterize Launch Abort Vehicle (LAV) Abort Motor Jet Interaction thrust offset effects, thrust ratio effects, and simultaneous Abort Motor and Attitude Control Motor Jet Interaction effects. The data will be used to refine the boost phase aerodynamic environments for the v0.54 database update for Design Analysis Cycle 4 (DAC 4).

Aerojet completed a Test Readiness Review (TRR) with NASA and Lockheed Martin in preparation for the upcoming development testing of new R-1E thruster valves (shown left.) A series of tests, including acceptance testing, life cycle testing, and vibration leakage testing will be performed on these valves over the next several weeks.

Members of the Landing and Recovery Working Group toured several Navy well deck ships and discussed with Department of Defense (DoD) personnel how recovery operations could occur. The ships visited were The USS IWO JIMA, The USS Ashland, and The USS Mesa Verde. Each have very similar characteristics to support recovery of the Crew Module (CM) with the crew on board, including a well deck that can be flooded to allow the CM to be winched into the bay and then the bay is drained so the recovery personnel can access the side hatch. (See below photos)